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(54) Title: FROZEN COCKTAILS MADE FROM A FLAVOR CONCENTRATE

(57) Abstract

A liquid frozen cocktail concentrate has a solid content, preferably entirely carbohydrates, such that when it is frozen in a freezer compartment of a conventional refrigerator, it is frozen to a solid, but softly ("quiescently") frozen. A suitable solid content produces a measured Brix value, measured on a disacharride scale, in the range of 10° to 25°. The solid content preferably consists of 1) pure or artificial flavors, particularly natural fruit juice and fruit fiber and 2) a sweetener, whether a natural sugar, or a high potency sweetener, or some combination thereof. The process includes producing such a concentrate, freezing such a concentrate to a quiescently frozen state, and mechanically blending it, e.g. using a conventional home food blender, with liquid diluent added in a weight ratio (w/w) of 1:1 to 3:1 frozen solid to liquid, and preferably in the range 1:1 to 2:1. For cocktails, the diluent is preferably a mixture of water and a distilled 80 proof distilled spirit in a volume ratio (v/v) of 2:1 to 4:1 water to spirit. The Brix of the concentrate can vary from 10° to 25°, but for most drink types is in the range of 16° to 22°, and preferably 18° to 21°. The Brix of the blended, finished cocktail is in the range of 9.0° to 15.0°, but for most drink types is preferably in the range of 11.0° to 13.5°.

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TITLE OF THE INVENTION
FROZEN COCKTAILS MADE FROM A FLAVOR CONCENTRATE

BACKGROUND OF THE INVENTION

This invention relates to frozen slush beverages, and in particular to a liquid flavor concentrate and a method of using the concentrate to form a high quality frozen slush cocktail.

Frozen cocktails are well known as mixtures of crushed or shaved ice, spirits, fruit juice, and sugar that is strongly mixed until the crushed ice is reduced to a "snowy" or "slush" consistency. Frozen daiquiris, margaritas and piña coladas in a variety of flavors such as strawberry, peach and citrus varieties have become increasingly popular as bar specialty drinks.

The traditional approach to making such frozen drinks begins with ordinary ice. It is then crushed, cracked, shaved or blended to form a slush to which a spirit, flavors and sweeteners are added. The traditional recipe, particularly for home use, is to use ice cubes that are pounded into crushed ice, e.g. in a canvas bag using a wooden mallet. The crushed ice is then blended into a slush. A conventional home blender can be used.

In practice, few hosts or bartenders wish to take the time and exert the physical effort required to crush ice cubes manually . As a result, to the extent that frozen drinks are made "from scratch" at home, they use ice cubes from a home freezer that are added directly to the cup of a blender. The other ingredients are added to the blender cup and the blender operates until the ice cubes are broken up into very small pieces.

This approach, however, has several drawbacks which have significantly hindered its use. First, the noise generated by the blender in pulverizing the rock-

hard ice cubes produced in a freezer compartment of a conventional refrigerator is substantial. Typical operating temperatures for home refrigerator freezer compartments are -10°F to +10°F, with 0° to 5°F being perhaps the most common temperature range. In contrast, ice at commercial bars is often stored at temperatures much nearer to 32°F, and as a result is "softer" than household ice. The temperature in home freezer chests is typically colder than in refrigerator freezer compartments, a typical range of values being -15°F to 5°F.

Second, fracturing and subdividing a cup full of home ice cubes produces substantial wear on the blades and the blender. A blender that is regularly used to pulverize ice cubes will perform more poorly as a food blender. Third, the pulverization process is fairly slow as compared to commercial blenders and specialized equipment such as the automatic frozen cocktail machines for bar use described in one of the present applicant's U.S. Patent Nos. 4,528,824 and 4,681,030 and commercial slush making machines which scrape ice as it forms on a chilled surface. Fourth, the various ingredients must be available at home and measured out individually. Fifth, in practice it is difficult for the an amateur bartender to produce frozen drinks "from scratch" and achieve a smooth consistency -- -- small ice particle of uniform size that preferably "peak" when poured into a glass - and a good taste. Some skill and experience is useful. Moreover, it is often impossible for a home blender to reduce all the ice particles to a uniformly small size regardless of skill in any reasonable length of time. As the cubes are fractured, the contents of the blender becomes more viscous and the movement of ice pieces to the blades becomes more difficult. This is particularly true where the slush being formed is "thick" -- as opposed to watery -- whether due to refreezing of divided

particles or to insufficient addition or production (due to melting of ice) of liquid in the slush.

To solve some of these problems, various companies have concocted and marketed dry powder mixes, liquid pre-mixes, and pre-frozen products for home use that all include flavoring and sweetening ingredients in pre-mixed portions. A dry powder mixer, for example, is marketed by Franco's Cocktail Mixes of Pompano Beach, Florida, under the trade designation "Franco's". It directs the user add the mix and spirits to an ice-filled cocktail shaker. However, the resulting drink is a traditional chilled cocktail, not a blended frozen drink. Heublein, Inc. of Farmington, Connecticut markets a liquid margarita mix under the trade designation "Cuervo" and Bacardi & Co., Ltd. markets a liquid margarita concentrate mix under the registered trademark "Bacardi Tropical Fruit Mixes". Theses liquid mixes are added, with a spirit, to ice in a blender cup.

While these and like mixes avoid the inconvenience of separately buying, storing, and measuring out or squeezing out flavor and sweetener ingredients, the aforementioned problems associated with reducing ice from a lump to a slush remain. There is the added problem that chemical preservatives, freeze point depressants, and other components that affect crystallization can affect the flavor of the finished drink. Further, the mix is portioned for a preset number of drink servings. The pre-mix product must be measured out to make single drinks, or drinks in a quantity other than that corresponding to the use of the entire package or bottle.

Several frozen flavor mixes for frozen cocktails are also known. Coca Cola Foods, for example, sells a frozen daiquiri concentrate under the trade designation "Bacardi Mixers". Like the powder and liquid mixes, it pre-mixes flavor, sweetening, texture and preservative

ingredients. And like the dry mixes, it also directs the use of ice. For alcoholic drinks, the user is instructed to add to a blender cup one container of the mix and a half to one container of rum. The user fills the blender with ice. Blending then yields five frozen daiquiris in 8 fluid oz. servings. Even without addressing the important issue of taste, the product suffers from the fact that it must be stored frozen, sold frozen, and maintained in a frozen state until used. The cost of freezer space in a retail store -- and the total absence of freezers in many stores that sell distilled alcoholic beverages -- make such frozen products unattractive for both cost and convenience reasons. Also, the product is sold in a can like frozen concentrated orange juice, and prepared in the same way, in a single large batch. It is not conducive to making single drinks to order, or any serving size other than that of a full blender.

U.S. Patent No. 3,647,472 to Speech, et al. describes a water, sugar, glycerol, flavoring mixture that is 20 to 40% solids and which freezes in a home freezer to a slush. The water forms ice crystals and the "syrup" of glycerol, sugar and other solids remains liquid. A serving size of this slush is added to a glass and stirred with a spirit or water to form a chilled liquid drink -- a cocktail if alcohol is used. The end product alcoholic drink is a liquid, not a frozen cocktail.

Heublein, Inc. has sold a complete, "ready to consume" frozen cocktail product. This product is believed to have been sold under the trade designation "Tropic Freezer®" and made according to U.S. Patent No. 4,790,999 to Ashmont, et al. assigned to Heublein, Inc. The Ashmont cocktail product includes flavor and sweetening ingredients, alcohol, and carboxymethylcellulose (CMC), all premixed. The CMC is described in this patent as a "critical" component in

producing the desired consistency when the product is frozen. The final product has a Brix value of 18° to 25°. Once frozen, it can be eaten directly from a container or spooned into a glass for a slush-type drink. It is not blended, let alone blended with an added liquid. To drink this product, it must be warmed to a drinkable consistency.

As a general rule, artificial additives degrade flavor. While organoleptic qualities are to some degree subjective, flavor and consistency of the fully pre-mixed frozen cocktails do not compare favorably to those of frozen drinks made fresh from crushed or shaved ice at bars (such as those made using the aforementioned automatic ice shaving and blending machine and the frozen cocktail fruit juice mixes manufactured and sold by the Island Oasis Frozen Cocktail Company of Walpole, Massachusetts under the registered trademark "Island Oasis®"). Dry, liquid and frozen concentrates without distilled spirits continue to dominate the home frozen cocktail market. Moreover, the market as a whole for frozen cocktail products for home use remains small as compared to the market for all home-use cocktail products.

To date, there has been no frozen cocktail product which can be stored and sold in a liquid form at room temperature, frozen at home in a conventional home refrigerator, and then conveniently used in a home blender, without any added ice, to produce a high quality frozen cocktail.

It is therefore a principal object of the present invention to provide a method of making a frozen cocktail and a flavor concentrate used in this method that is a sold as a liquid, frozen, and then directly blended without ice.

Another principal object is to provide a method and concentrate product with the forgoing advantages that blends rapidly in an ordinary home blender to form

a high quality frozen cocktail, as well as non-alcoholic versions of the cocktails, in any of a wide variety of flavors and types.

Another object is to provide a flavor concentrate that does not separate or hard freeze when frozen in a conventional home refrigerator.

Still another object is to provide a method and product with the foregoing advantages which is convenient to store and use and requires no special skill or equipment to make professional quality drinks quickly, quietly, and in any preselected number of drinks.

A further object is to provide a product for use in the method which can be made of all natural products, yet stored without preservatives, for extended periods of time to provide a long shelf life.

SUMMARY OF THE INVENTION

A flavor concentrate used to make a frozen cocktail has a total solid content, including sweeteners and flavor ingredients, that is equivalent in depressing the freeze point of a water solution to a disaccharide aqueous sugar solution with a Brix value in the range of 10° to 25°, in the range of 16° to 22° for most drink types, and preferably in the range of 18° to 21°. This Brix value is a sufficiently accurate weight measure of the solid content of the concentrate to its total weight. The desired equivalent Brix value in this range varies with factors such as the type of drinks being made and the volume and the nature of liquid additives, e.g., a distilled alcohol product and water. The solid content is preferably totally carbohydrates. Defined functionally, the total solid content should be such that 1) when frozen at temperatures typical of a home freezer (e.g., 0°F ± 10°F), the concentrate is softly, or "quiescently", frozen; and 2) when blended with a

liquid according to this invention, will produce a frozen drink that blends readily to produce a drinkable slush of generally small uniformly sized ice particles with excellent organoleptic characteristics. The finished drink preferably "peaks" when poured into a serving glass. Using a conventional one quart home blender operating at high speed, blending typically is completed in 10 to 30 seconds. The "finished" (disaccharide scale) Brix of the resulting frozen cocktail is preferably in the range of 11.0° to 13.5°, but can lie within the range 9.0° to 15.0°.

The process of this invention includes freezing a liquid flavor concentrate with such a solid content to a solidly, but softly, frozen state, and blending a measured portion of the frozen concentrate with a liquid diluent consisting of a distilled spirit, water, or a mixture of a distilled spirit and water. The weight ratio (w/w) of solid frozen concentrate to diluent is in the range of 1:1 to 3:1. The preferred formulation for the diluent is a mixture of water and a distilled spirit (such as 80 proof rum, gin or tequila) in a 2:1 to 4:1 volume ratio (v/v) of water to spirit.

The concentrate preferably is formulated from all natural products including natural sugars, sweeteners such as sucrose, dextrose and fructose and natural fruit flavors such as berry, citrus, or peach derived from the juice, fibers, and other naturally occurring nutrients in the selected fruit or fruit blend. The water is preferably refrigerator-chilled bottled water to avoid variations in flavor due to varying mineral contents of tap water and variation in its temperature. Chilling the water before use aids in the blending. Proportions of frozen concentrate, spirits or other liquid to produce the desired flavor and texture in the finished drink vary with the type of drink (e.g. daiquiri, margarita, piña colada) and flavor (e.g. strawberry, peach, banana) and personal taste.

However, the nature, solid content (expressed as a Brix value), and sweetness of the concentrate are mutually adjusted to produce a smooth blended cocktail with the desired taste. For many drinks and flavors, a mix of about 4 oz. by weight of frozen concentrate, about 3 fluid oz. of water and about 1 fluid oz. of 80 proof distilled spirit is preferred. The frozen concentrate is preferably blended as four separated portions each weighing about 1 oz. (28.4g).

These and other features and advantages of this invention will be more fully understood from the following detailed description which should be read in light of the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the method of the present invention for making frozen cocktails without blending ice;

Fig. 2 is a view in perspective illustrating the blender addition steps of Fig. 1; and

Figs. 3-5 are graphs of the pressure applied to a cube of softly frozen concentrate by a shear press piston as a function of time/distance for low, medium and high solid contents in the concentrate.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 gives an overview of the method of the present invention for making high quality frozen cocktails 10 at home. The present invention supplies a water based concentrate 12 that is a liquid at room temperature, freezes it at typical home freezer temperatures, as represented at block 14, to form a solid concentrate 16 that is softly frozen, and adds the frozen concentrate to a blender cup 18 along with a liquid diluent 20. A blender 22, preferably a conventional home kitchen blender used for food

processing, then operates to blend the frozen concentrate 16 and the liquid 20 into a slushy suspension of finely divided particles of the frozen concentrate.

The mechanical resistance of the frozen concentrate to being blended and the texture or smoothness of the final drink depend strongly on the level of solid content in the concentrate and on the temperature to which it is frozen. The ability of the process to produce a smooth, good-tasting end product drink also depends strongly on the volume ratio of the frozen concentrate to the diluent, and the nature of the ingredient forming the concentrate and the diluent. The type of solids is also a factor. As a general rule, except where taste considerations override, the solids should be carbohydrates. To make an alcoholic cocktail, diluent can be exclusively a distilled spirit. However, blendability is usually improved if the liquid volume is increased by adding water. Water content in the slurry is also influenced by warming of the ice in the frozen concentrate due to the warmer temperatures of the admixed liquid, the blender cup, the ambient air, as well as the mechanical working of the mixture by the rotating blades 24 of the blender as it operates. Therefore these temperatures and the blending time and speed are also factors that affect texture, but to a lesser degree than the other factors noted above as strongly affecting blendability and finished drink quality.

The concentrate 12 in its simplest form is a solution of water 26, a flavor ingredient or ingredients 28, and a sweetener or sweeteners 30. The flavor ingredient 28 is typically a fruit flavor, preferably one provided by a natural fruit juice, a blend of fruit juices, or a combination of fruit juice and crushed natural fruit or fruit pieces. The natural juice and crushed fruit also introduce to the

concentrate natural fruit fibre and small amounts of naturally occurring nutrients found in the natural fruit being used. Solids in the concentrate which do not add positively to the flavor of the finished drink are referred to herein as other ingredients 32. The other ingredient 32 includes not only unflavored fibre and naturally occurring non-flavoring protein and fat nutrients, but also natural and artificial solids such as glycerol, p-glycerol, salts, gums and preservatives.

Typical flavors are varieties of citrus, varieties of berry, banana, and peach. While a natural fruit juice, with or without crushed fruit or fruit pulp, is preferred, it is possible to use artificial flavors, or combinations of natural and artificial flavors, as is well known in the food industry. Non-fruit flavors, or blends using fruit flavors only in part, can also be used. Examples of such flavors are piña colada and ice cream. However, regardless of the flavor, as noted above, it is essential that the concentrate have a total solid content that is softly frozen at freezer temperatures available to, and selected by, the user. The liquid frozen cocktail mix now sold for commercial bar use by the Island Oasis Frozen Cocktail Co. of Walpole, Massachusetts under its registered trademark "Island Oasis" is preferred. It is made and sold in a variety of natural flavors for numerous drink types, e.g. strawberry, banana, ice cream, and peach daiquiri, regular flavor margarita and piña colada.

The sweetener 30 is likewise preferably a natural sugar such as sucrose, glucose, or fructose. The flavor ingredient 28, particularly of a naturally sweet fruit, will often itself have a measure of naturally occurring sugar, but for the flavors and frozen drink types now popular it is necessary to add the sweetener 30. The amount of sweetener to be added ultimately depends in part on the taste and texture of the final blended frozen cocktail.

The sweetener 30, the flavor ingredient 28, and the other ingredients 32, provide a total solid content in the water-based concentrate that yields the functional characteristics and finished product of the present invention as described herein.

More specifically, the total solid content of the concentrate 12 should produce a depression of the freezing point of the concentrate that is equivalent to the freezing point depression of a solution of a disaccharide sugar (e.g. sucrose) in water having a Brix value in the range of 10° to 25°, and for most drinks a high value in the range of 16.0° to 22.0°, and preferably in the range of 18° to 21°. The solid content value is calculated as a weight ratio of the solid content to that of the solid content in solution, the concentrate. While Brix, a measure of the specific gravity of a sugar solution, is used as a weight measure of sucrose in a sucrose-water solution, it is known that the change in specific gravity of a sugar solution produced by sucrose is substantially the same as the changed produced by other natural sugars such as glucose and fructose. Moreover, the presence of non-sugar solids causes only small errors in the Brix value. Standard disaccharide Brix is therefore a reasonably accurate measure of total solid content of aqueous sugar and flavor solutions regardless of the exact nature of the solids, and is so used herein. The Brix measurement of the frozen cocktail product is skewed by the presence of the ice crystals. It is measured after the ice content of the cocktail has melted.

The measured Brix value varies within this range depending on factors that include (i) the nature of the ingredients, 28, 30 and 32 to produce the desired drink, (ii) whether the cocktail 10 contains alcohol or is non-alcoholic, e.g. a "virgin daiquiri", (iii) the temperature of which the concentrate will be frozen,

(iv) the nature and volume of the liquid 20 in proportion to the volume of frozen concentrate used, and (v) the nature of the sweetener, e.g. a simple sugar, a complex sugar, an artificial sweetener, (vi) the temperature of the blended ingredients and (vii) the strength of the distilled spirit and the mineral content of the water used as the liquid 20. In general, alcohol as a diluent greatly aids in blending of the frozen concentrate to form the finished drink. Non-alcoholic slush drinks are therefore more difficult to blend and, in general, require a longer blending time and offer less latitude in the range of portions of ingredients and other process parameters than alcoholic frozen cocktails. Other considerations include (i) the characteristics of the concentrate when it is frozen and when it is broken up in the blender, such as whether the ingredients of the concentrate freezes to a soft solid at temperatures normally found in a home freezer, whether the frozen concentrate blend readily into finally divided and evenly dispersed frozen particles when blended, whether the concentrate separates when frozen at home freezer temperatures, (ii) the sweetening power of the particular sweetener, and (iii) the solid content contributed to the concentrate by the sweetener 30. As is well known, a monosaccharide such as glucose or fructose is sweeter than a disaccharide such as sucrose, and certain high potency sweeteners such as aspartame, at least when used in low concentrations, are much stronger sweeteners than like amounts of natural sugars.

The following are examples of concentrates 12 and methods according to the present invention of using these concentrates. All cocktails were prepared using a conventional home blender such as an Imperial brand, two speed, one quart size blender manufactured by Osterizer, Inc. at its "high" operating speed, to produce frozen cocktails of high quality in taste and

texture without using ice cubes, pre-crushed or crushed ice, or shaved ice. Ingredients were weighed on an Ohaus brand triple beam scale to the nearest 0.1g (2,610g capacity). The concentrates were mixed in a sealable plastic container by shaking until thoroughly mixed. The concentrate was frozen in conventional plastic ice cube trays for 48 hours in a standard 6 cubic foot capacity, chest-type home freezer set to a freezing temperature of -15°F. Brix values were measured with Milton-Roy Co. hand-held refractometer, Cat. No. 33-45-01. The concentrates were formed by diluting frozen cocktail mixes sold under the trade designation Island Oasis® with water. The spirits used are 80 proof and at room temperature. Rum is preferred for daiquiris and piña coladas. Tequila is preferred for the margarita. The frozen concentrate is added in cubes produced by the ice-cube tray, with each cube representing about 1 fluid ounce of concentrate (about 32g). The water is bottled water chilled in a conventional refrigerator.

EXAMPLES

Frozen Drink Type	Brix of Concentrate	Blended Frozen Concentrate (Fluid oz.)	Blended Water (Fl. oz.)	Blended Spirit (Fl. oz.)	Blend Time (sec.)
Strawberry Daiquiri	19.5	4.0	3.0	1.0	15
Peach Daiquiri	19.5	4.0	3.0	1.0	15
Banana Daiquiri	20.5	4.0	3.0	1.0	15
Non-Alcoholic Banana Daiquiri	20.5	4.0	4.0	-	15-20
Margarita	18.5	5.0	3.0	1.0	15
Piña Colada	20.8	6.0	3.0	1.0	15
Non-Alcoholic Piña Colada	20.8	6.0	4.0	-	15-20
Ice Cream	19.8	6.0	3.0	1.0	15
Non-Alcoholic Ice Cream	20.8	6.0	4.0	-	15-20

It will be understood that these values are approximate and that the user can vary from the recommended values and procedures, whether in error, out of convenience, or due to taste and still obtain a high-quality, good-tasting frozen drink. As reflected in these examples, a concentrate with a Brix in the range of 18° to 21° will produce an optimal finished drink for most standard drink types. As a general rule, increasing the liquid 20 added to the blender without a corresponding increase in frozen concentrate will reduce the blending time and produce a more watery slush. A practical lower limit on the frozen concentrate-to-diluent ratio is determined by the fact that the slush becomes too watery (too low of a viscosity to blend) even at reduced blending times, when too much liquid is used. On the other hand, reducing the liquid content increases the ice content in the frozen drink, making it "stiffer". (A good slush texture is characterized by the finished drink "peaking" when poured into a glass, but being readily pourable and drinkable with few, if any, large frozen particles.) Practical lower limits on the amount of diluent liquid added to the blender arise when the frozen concentrate will not blend well, e.g. it will freeze to the walls of the blender cup, will not circulate to the blender blades, or will not divide uniformly and finely, e.g. "marbles" of frozen concentrate remain the slush after the recommended blending time. The weight ratio (w/w) of frozen concentrate 16 to liquid diluent 20 is in the range of 1:1 to 3:1, but preferably closer to 1:1 for most drink types.

Large, irregularly-sized frozen particles will also result from the Brix level of the concentrate being too low. Conversely, Brix that is too high results in a watery slush. These results and taste considerations, provide practical functional guidelines

for selecting appropriate values for particular type of concentrate and a particular drink. With respect to taste, a Brix value for the final product can range from 9° to 15°, but drinks with the best taste will preferably have a value in the range of 11.0° to 13.5°.

With respect to the spirit to water ratio in the diluent liquid, as a general rule, as noted above, increased alcohol content facilitates the blending. Therefore if a higher alcohol content is desired, the blending time is ordinarily reduced. The overall liquid volume, the volume of the spirit and water, should, however, remain at or near the preferred values given, other factors being the same. The preferred ratio for the diluent ingredient in an alcoholic frozen cocktail is in the range of 2:1 to 4:1 water-to-spirit by volume. As demonstrated in the Examples above, a 3:1 ratio is preferred for many drink types.

The affect of Brix on the blendability (and therefore texture) of the frozen concentrate is illustrated by Figs. 3-5. Graphs showing the fracturing of a cube of frozen sugar water concentrate over time as the pressure applied by an FTC shear press. The press is a standard instrument used to measure the resistance of a solid to a crushing force applied by a pneumatic piston. Since the piston travels at a generally constant rate, elapsed time equals distance travelled by the piston. Fig. 3 is a typical graph for a solution with a low solids content (e.g. below 12.5° Brix). Fig. 4 shows the typical reaction curve for a medium solid content (e.g. 15°-20° Brix). Fig 5 shows the typical reaction curve for a high solid content (e.g. in excess of 20° Brix).

In each graph the initial pressure increase reflects the resistance of the frozen cube to fracturing. This result is a function of solid content and the temperature of the frozen cube. The curves show typical results for cubes at the same temperature.

After initial fracture indicated at F in the graphs, the shear press piston travels farther until a second resistance is encountered. The degree to which the pressure falls after the initial fracture, expressed as a percentage pressure relief, yields an indication of how resistance to fracture varies as a function of solid content.

The second increase of pressure as the shear press piston travels to a maximum compression of the sample varies in smoothness as a function of the solid content. Higher solid content produces a smoother crush curve, as shown.

These tests confirm that solid content of the concentrate is a key factor in the blendability of the frozen concentrate into a good slush. More specifically, softly frozen samples with a Brix below 12.5°, and certainly below 10.0° are difficult to crush and do not produce a uniform particle size in a blended frozen drink product. Conversely, solid contents much in excess of about 20.0 Brix are too soft to produce a high quality slush drink when blended. This range of Brix values also produces, at ordinary home freezer temperatures, a softly frozen concentrate that does not dull or damage an ordinary home blender used to of reduce frozen concentrate into finely divided slush. Recall, however, that blendability varies depending on the type of the ingredients forming the concentrate and the diluent and the relative amount of frozen concentrate and diluent. These tests do not reflect these variables; but they do demonstrate the basic relationship between Brix and fracture.

The fracture characteristics of a frozen concentrate according to this invention also lend themselves to partitioning a mass of the frozen product into pre-measured portions. This and the ability to freeze cubes of the concentrate in a conventional ice

cube tray allows frozen drinks to be made in any of a wide variety of quantities, from a single serving to batches of multiple servings.

There has been described a frozen drink product and process that can be sold and stored as a liquid, home frozen, and then blended quickly and quietly using a standard home blender to produce frozen drinks, particularly frozen cocktails, having a high quality taste and texture. The product and process can make a variety of drink types in a variety of flavors, and in a variety of serving sizes. A low skill level is required. There is minimal preparation time (once the concentrate is frozen), and the preparation is simple, comparatively quiet, and does not harm the blender. The product and process do not require expensive or unusual ingredients, and preferably uses only natural carbohydrates as it s solid content in the aqueous based concentrate, typically a fruit juice and a natural sugar in aqueous solution diluted to a Brix value in determined accordance with this invention. The product and process of this invention are also highly flexible in terms of the types of drinks - alcoholic, non-alcoholic, fruit based, non-fruit based -- that can be made while enjoying all of these advantages.

While the invention has been described with respect to its preferred embodiments, it will be understood that various modifications and alterations will occur to those skilled in the art from the foregoing detailed description and drawings. For example, while the invention has been described with respect to a concentrate formed by diluting an Island Oasis® brand of cocktail mixes, the concentrate can, of course, be made from other fruit and non-fruit aqueous solutions, providing they have the solid content to fall within the teachings of the present invention and can satisfy the flavor and sweetness requirements

inherent in making a selected frozen drink. As noted above, while it is not preferred, the solid content can include high potency sweeteners, gums, glycerol or other sugar alcohols, artificial flavors or color ingredients, preservatives, and other carbohydrate-based ingredients. Total solid content considerations must be observed, but the main considerations are the net affect on taste, blendability, and final product texture.

Similarly, while chilled bottled water is a preferred diluent, tap water can be used, but with risks of variation in taste due to the mineral content of the tap water and some small variations in blendability and texture due to he water content and warmer ambient temperature of tap water as compared to chilled bottled water. The alcohol diluent can be any of a wide variety of spirits, and in varying proofs. More neutral spirits such as rum, gin, vodka and tequila are preferred. Liqueurs could be added for taste or color.

Different blending arrangements also fall within the scope of this invention. While a standard home blender is preferred, it is possible to use food processors, food mixers, power stirrers, and even manually powered mechanical blending provided that the blending implement can break apart the frozen concentrate into a finely divided state while mixing it with the diluent liquid.

These and other variations and modifications are intended to fall within the scope of the appended claims.

What is claimed is:

1. A process for making a slush drink with a generally uniform consistency comprising

freezing a flavor concentrate solution of solids, including sweeteners, in water, said solid content and the temperature of said freezing having a values such that said flavor concentrate solution is softly frozen,

adding a liquid diluent, and

mechanically blending the frozen concentrate with said liquid diluent to produce the slush drink.

2. The slush drink making process of claim 1 wherein said solid content of said flavor concentrate solution has a Brix value in the range of 10° to 25°.

3. The slush drink making process of claim 1 wherein said solid content of said flavor concentrate solution has a Brix value in the range of 16° to 22°.

4. The slush drink making process of claim 1 wherein said solid content of said flavor concentrate solution has a Brix value in the range of 18° to 21°.

5. The slush drink making process of claim 1 wherein said freezing temperature is in the range produced in conventional home refrigerator freezer compartments.

6. The slush drink making process of claim 1 wherein the weight/weight ratio of said softly frozen flavor concentrate to said diluent is in the range of 1:1 to 3:1.

7. The slush drink making process of claim 1 wherein said mechanical blending comprises providing a conventional food blender with a blender cup, placing said frozen flavor concentrate in said blender cup, and operating the blender until the frozen said component of frozen flavor concentrate is of a generally uniform, generally small size.

8. The slush drink making process of claim 1 wherein said liquid diluent is selected from the group consisting of water, a distilled spirit, and a mixture of water and a distilled spirit.

9. The slush drink making process of claim 8 wherein said liquid diluent is a mixture of water and a distilled spirit in a volume ratio in the range of 2:1 to 4:1.

10. The slush drink making process of claim 1 wherein said solid content consists of carbohydrates.

11. The slush drink making process of claim 10 wherein said carbohydrates are selected from the group consisting of sucrose, glucose, fructose, a high-potency sweetener, natural and artificial fruit flavors, fruit fiber, and combinations of these substances.

12. The slush drink making process of claim 1 wherein the blended slush drink has a Brix value in the range of 11.0° to 13.5°.

13. A liquid frozen cocktail concentrate that can be soft frozen before use, comprising, a solution of water and a solid content including a flavor ingredient and a sweetener, where said solid content has a Brix value in the range of 16° to 22°.

14. The concentrate of claim 12 wherein said Brix value is in the range of 18° to 21°.

15. The frozen cocktail concentrate of claims 13 or 14 wherein said solid content consists of carbohydrates.

16. The frozen concentrate of claim 15 wherein said carbohydrates are selected from the group consisting of sucrose, glucose, fructose, a high-potency sweetener, sugar alcohol, natural and artificial fruit flavors, fiber, and combinations of these substances.

17. A frozen drink made by the process of claims 1-12.

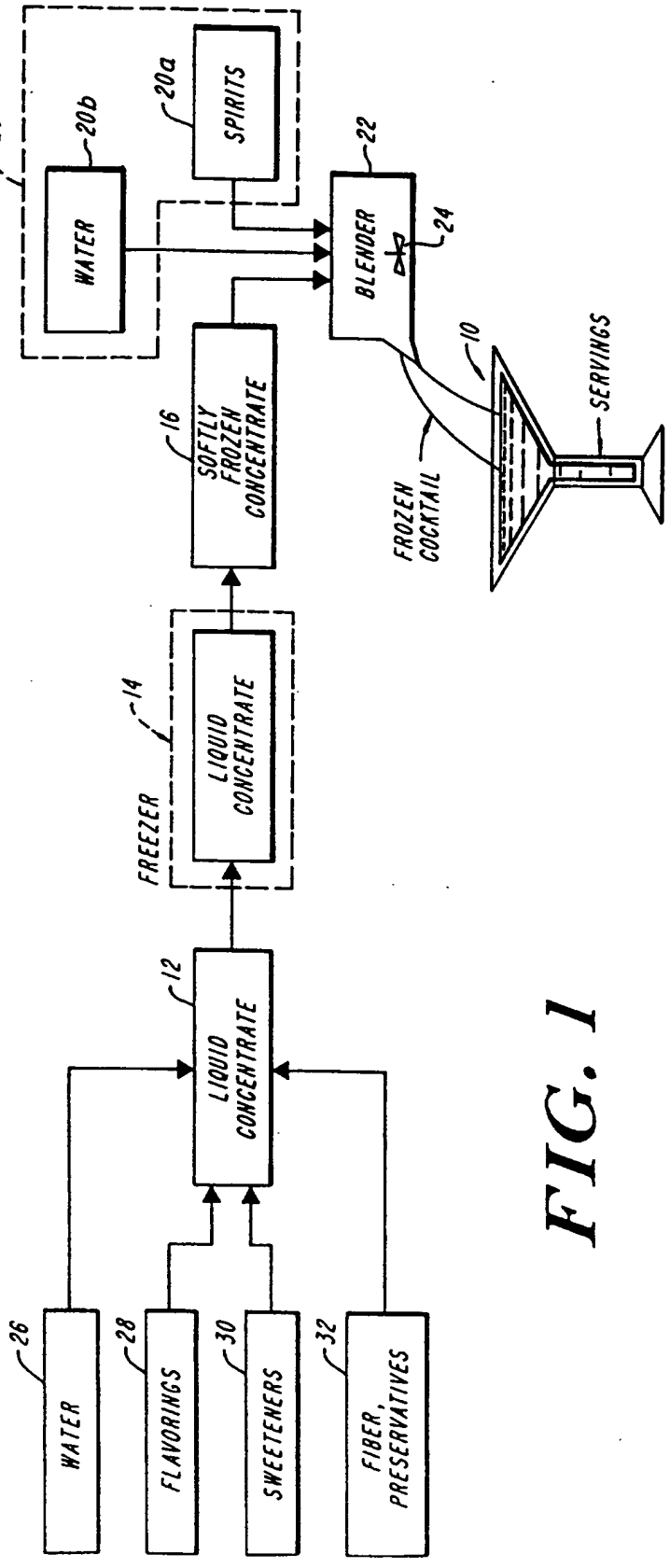
20
20b
WATER
20a
SPIRITS
22
BLENDER
24
10
SERVINGS
FROZEN COCKTAIL
16
SOFTLY FROZEN CONCENTRATE
FREEZER
14
LIQUID CONCENTRATE
12
LIQUID CONCENTRATE
26
WATER
28
FLAVORINGS
30
SWEETENERS
32
FIBER, PRESERVATIVES

FIG. 1

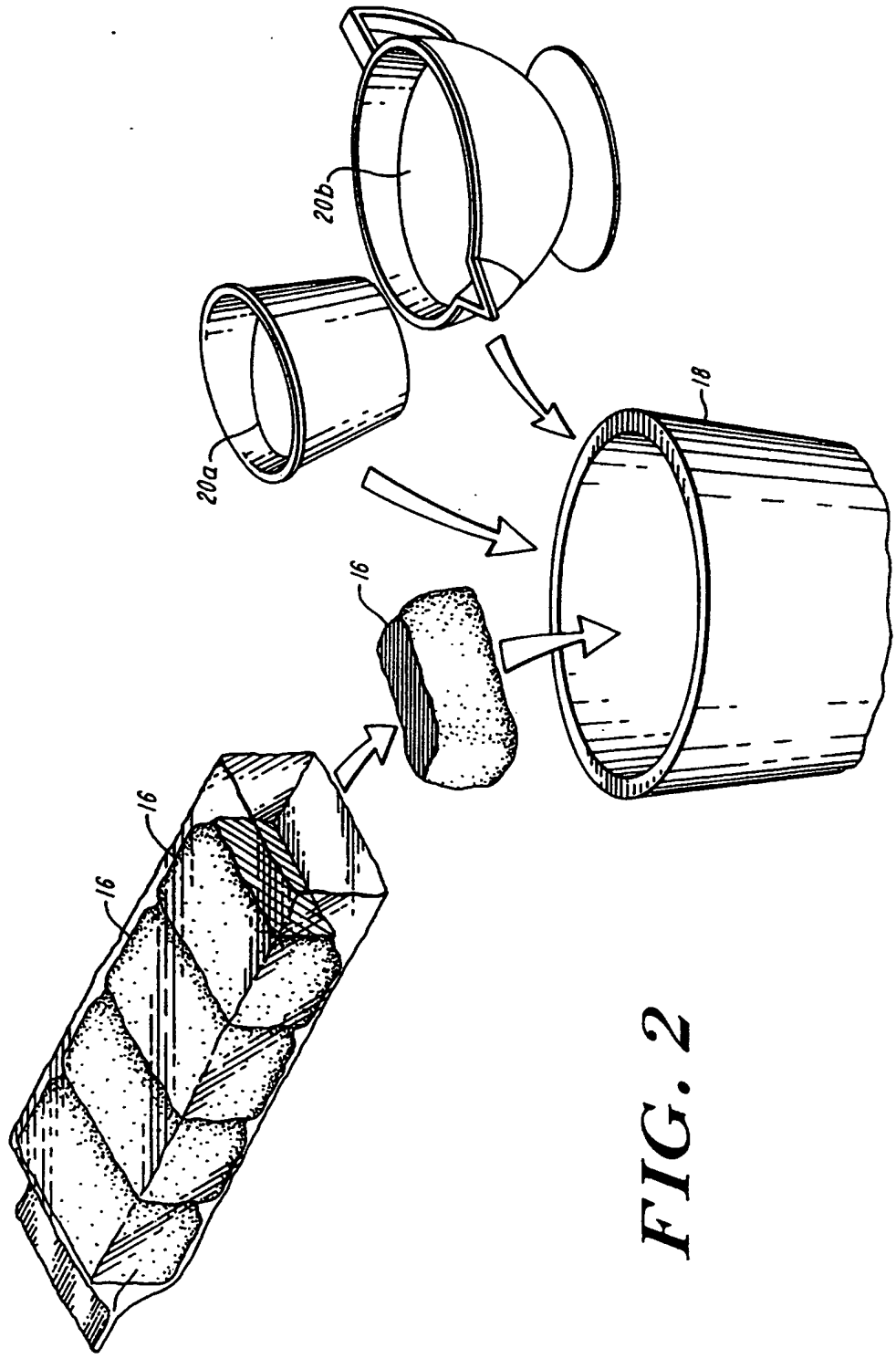

FIG. 2

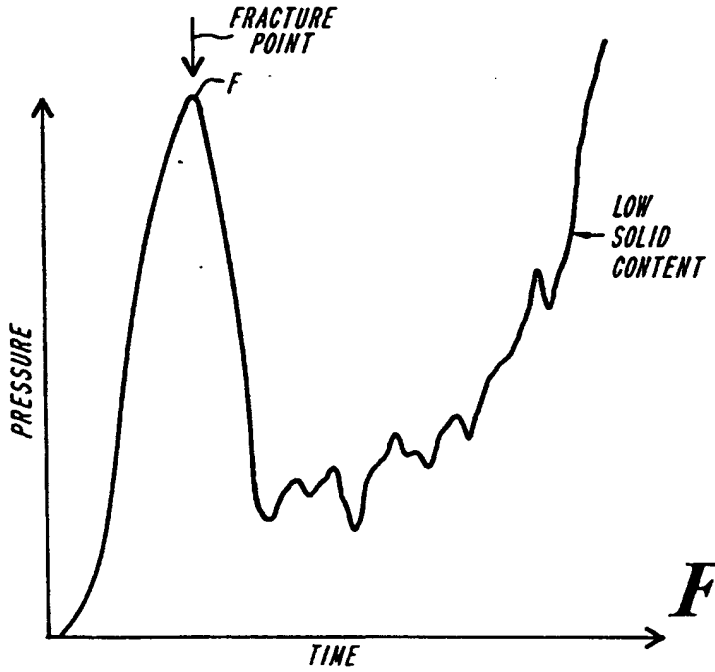

FIG. 3

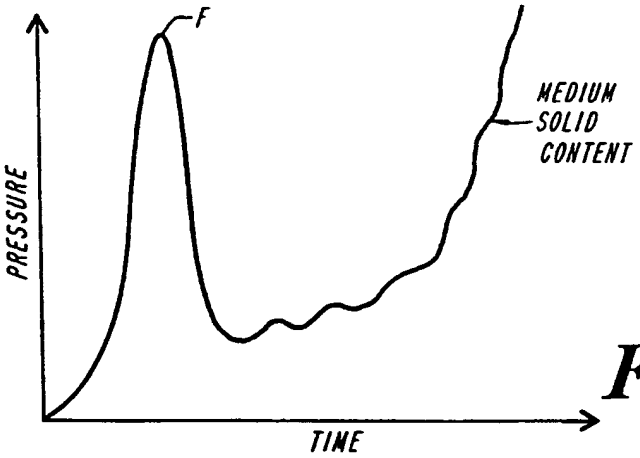

FIG. 4

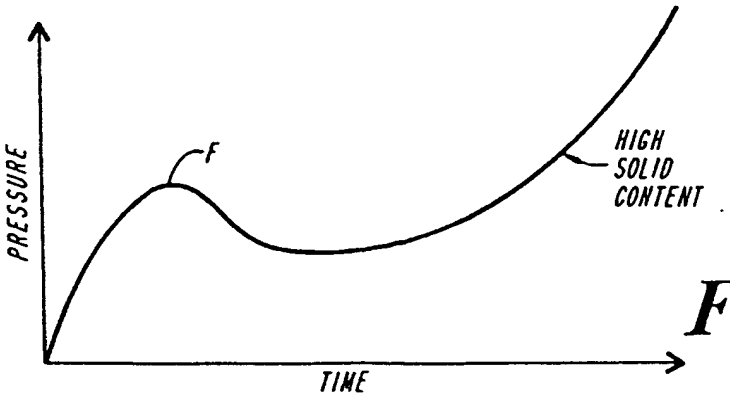

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/06442

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A23L 2/00, 3/36; C12G 3/06, 3/10
US CL :426/393, 524, 592, 650
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 426/393, 524, 592, 650

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US, A, 3,647,472 (SPEECH ET AL) 07 March 1972, col. 2, lines 28-58, col. 4, lines 61-64.	1-8, 10-17 --- 9
X --- Y	Fresno Bee, Food Section, Wenesday, 28 October 1992, C. M. Ocheltree, "A Perfect Treat for Halloween", page E3.	1-5, 8, 10, 11, 13-17 --- 6, 7, 9, 12
X --- Y	Pittsburgh Press, Entertainment Section, Wenesday, 19 June 1991, Press News Service, "Orange Mint Slush a Cool Drink", page B3.	1-5, 8, 10, 11, 13-17 --- 6, 7, 9, 12

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
26 JUNE 1996	11 JUL 1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ESTHER KEPPLINGER Telephone No. (703) 308-2339

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/06442

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	State (Columbia), Metro/Region Section, Final Editio:., Wenesday, 05 December 1990, M. J. Terry, "Knockout Puches for the Holidays Beverges Provide that Festive Touch", page 1E.	1-5, 8, 10, 11, 13-17 --- 6, 7, 9, 12
X --- Y	Record (Northern New Jersey), Lifestyle/Food Section, All Editions, Wenesday, 01 September 1993, M. Marter, "The Weather Has Been Just Peachy, The Weather Has Been Just Peachy", page C03.	1-5, 8, 10, 11, 13-17 --- 6, 7, 9, 12

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